



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

KASAHARA et al

Serial No. : 10/537,376

Group Art Unit : 1793

Filed : June 3, 2005

Examiner : ABU ALI, SHUANGYI

For : CALCIUM PHOSPHATE BASE PARTICULATE COMPOUND, PRODUCTION  
METHOD OF THE SAME, AND COMPOSITION CONTAINING THE COMPOUND

DECLARATION

Honorable Commissioner of Patents

and Trademarks

Washington, D.C. 20231

Sir:

Hidemitsu KASAHARA, a citizen of Japan residing at Maruo Calcium Company Limited of 1455, Nishioka, Uozumi-cho, Akashi-shi, Hyogo-ken, Japan, being duly sworn depose and says that:

1. I graduated from Department of Engineering of Fukui University in 1993. I was employed by MARUO CALCIUM COMPANY LIMITED on April 1, 1993. Since then, I have been engaged mainly in research and development on inorganic additives for resins and films, and synthesis methods of the fine particles up to today. I have numerous patent applications and patents on the subjects, and have delivered several papers on those subjects. In 2005, I received a degree of doctor from Fukui University.

2. I am one of inventors of the present invention. I have studied and am fully familiar with this specification and claims, the cited references and the Office Action dated January 5, 2010.

3. The following experiments were carried out in order to demonstrate that by a heating treatment temperature after aging, the obtained calcium phosphate base particulate compound can be unexpectedly improved in thermal stability.

### EXPERIMENTS

#### (1) Additional Example 1

A powder of calcium phosphate base particulate compound was obtained in the same manner as in Example 1, except that the heating treatment temperature was changed to 100°C. The physical properties of the obtained powder and production conditions are shown in Table A.

#### (2) Additional Comparative Example 1

A powder of calcium phosphate base particulate compound was obtained in the same manner as in Example 1, except that the heating treatment temperature was changed to 97 °C. The physical properties of the obtained powder and production conditions are shown in Table A.

As is apparent from the comparison of Additional Example 1

and Additional Comparative Example 1, thermal stability is unexpectedly improved from 126 mg/g to 91 mg/g (the smaller, the better) by a difference of just 3°C in heating treatment temperature.

4. All statements made herein are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated this 25th day of May, 2010

Hidemitsu Kasahara

Hidemitsu KASAHARA

Table A

	Add. Ex. 1	Add. Comp. Ex. 1
(a) Sw (m <sup>2</sup> /g)	84	103
(b) Tg (mg/g)	<u>91</u>	<u>126</u>
(c) Dx50 (μm)	0.08	0.07
(d) Dx50/σx	8.8	7.5
(e) α (dispersibility of particles)	3.6	5.2
(f) β (uniformity of particles)	2.2	2.6
Chlorine ion(ppm)	2300	3500
(g) Dxp (μm)	0.020	0.019
(h) Dyp/Dxp	30	24
Crystal form	hydroxyapatite	hydroxyapatite
Ca/P	1.62	1.54
Particle shape	pillar	pillar
(1) Ca conc. (wt %)	10	10
Kind of Ca compound	CaCl <sub>2</sub>	CaCl <sub>2</sub>
Complex forming substance	—	—
Amount (wt %)	—	—
(2) Phosphorus conc. (wt %)	10	10
Kind of phosphoric acid compound	Na <sub>2</sub> HPO <sub>4</sub>	Na <sub>2</sub> HPO <sub>4</sub>
(3) Reaction temperature (°C)	30	30
(4) Dropping time (min)	30	30
(5) Stirring blade peripheral speed (m/s)	3	3
(6) pH at phosphorylation	6.5-7.5	6.5-7.5
(7) Aging time (hr)	5	5
(8) Calcium phosphate conc. (%)	5.0	5.0
(9) Heating treatment temp. (°C)	<u>100</u>	<u>97</u>
(10) Heating treatment pH	6.2	6.2
(11) Heating treatment time (hr)	12	12
(12) Stirring blade peripheral speed (m/s)	1	1
Washing filtrate conductivity (μS/cm)	150	150
Surface treatment agent	poly sodium acrylate	poly sodium acrylate
Surface treated amount (wt %)	5	5